THE BIGGEST TELESCOPE YET.

A 165-FOOTER BUILDING AT THE YERKES OBSERVATORY.

Not a Tube, but a Long, Low Shed—Photography Will Do the Observing—If Successful, a 1,000-Foot Telescope May Come—The New Astronomy.

CHICAGO, April 19.—Imagine a telescope a thousand feet long mounted on the summit of a lofty tableland in the clearest obtainable atmosphere.

Conceive it not as a slender steel tube mounted on an axis turned by a gigantic but delicate astronomical clock in a dome covering forty acres of ground, but as a long, low shed, without windows or doors in its sides and with nothing about it to relate it to the observatories of to-day except a ten-foot plane mirror mounted on a cœlostat at one end, and back of and about the mirror laboratories filled with the largest and best obtainable apparatus for the analysis and study of star images. And with all this, what else?

Perhaps nothing at all, for the thousand-foot telescope is as yet only the astronomer's dream, and in a large way its future is conditioned upon the success of a smaller but still enormous telescope under construction at the Yerkes Observatory of the University of Chicago at Williams Bay, Wis.

Perhaps, on the other hand, unimaginable things about distant worlds as yet undiscovered; the details of star clusters and nebulæ, of which even the existence is as yet unknown; more probably, phenomena in connection with the moon and the planets, which will make the fancies of a sensationalist novelist take secondary place in fascinating literature.

And with all this, an emancipated astronomer, seated in the midst of his apparatus, directing, focusing, but no longer following with weary eye and tired body the slow progress of the butt end of the telescope across the observing floor. For, while the 1,000-foot telescope is still a dream, the 165-foot instrument is nearing completion at the Yerkes Observatory. Should it be successful, it will mark the introduction of the methods of the physical laboratory into astronomy on a large scale, and will enable the astronomer to apply to the details of his work recording and measuring instruments which can not be operated with any telescope that must be balanced and moved by an astronomical clock.

We are accustomed to think of a telescope as a long steel tube equipped with lenses for bringing close to the observer the image of the star or nebula. We think of the astronomer as a man doomed to spend the nights of his life in a cold dome, open to the weather, while with the eye glued to the smaller end of the big instrument he moves hour after hour across the floor of the observatory, slowly noting down the phenomena which he there observes. These phenomena the layman must take on the astronomer's word.

In the last twenty years, to be sure, photography has come into vogue as a method for recording these observations. More recently it has been discovered that astronomical photographs may show things which cannot be seen with the naked eye, even through the most powerful telescope.

The astronomer has learned that by attaching a photographic plate to his telescope and keeping it at a given point in the heavens for several hours he will find on developing the plate that he has a better image of the stars in that part than his eye gave him—since his eye was subject to fatigue and the plate was not. Besides, he will have a record that he may show wherever he will, which is as plain to any one without a telescope as it is to him.

Moreover, he may find—as has frequently happened—that he has countless stars and perhaps even nebulæ recorded which he has never seen. Though he may gaze for hours, he cannot see these with his eye. Yet by the use of successive plates he can study their phenomena from night to night and preserve a record of them that will show whether any change in position or shape is taking place.

Taking these stellar photographs is a difficult job. In the first place, the lenses of the telescopes are made for the use of the eye.

Glass will not refract all rays of light equally. Consequently, when we wish to focus rays with a lens we must use one which will bring to a focus the particular rays we need to use.

Our eyes see with the yellow and green rays, and these are the ones that are focused in visual lenses, such as are used in telescopes. Ordinarily, the photographic plate is sensitive to blue and violet rays, and to those ultra-violet rays which are beyond the eye.

When it was decided to use the big Lick telescope for photographing the heavens it was found necessary to construct an additional lens, at the cost of $12,000, to put on over the visual lens, that it might focus the actinic rays needed. That shortened the focus of the telescope and made it awkward to handle. But it enabled the astronomers to get very wonderful pictures, especially of the moon.

But photographic plates need not be sensitive to the blue and violet alone. It is possible to orthochromatize the plate—that is, to dye the solution with which it is sensitized so that it will be affected by other rays. And in this way a plate can be made that will be affected by the yellow and green, though it will still be more sensitive to the blue and violet.

By introducing a yellow screen in front of the plate, so as to let no blue rays through, this plate can be used with a visual lens, and the picture that the eye sees can be thus recorded—that is, the image can be printed in by the same colored rays that the eye sees with. This is the actual process employed at several observatories to-day—notably at the Yerkes Observatory, where it has made the forty-inch refractor, the largest in existence, a photographic instrument.

But when they came to take photographs with this big telescope at the University of Chicago Observatory the astronomers faced the same experience that others had—the big telescope would not take such good photographs of the fainter stars as the smaller instruments would. In fact, as the observatory was equipped with a battery of three telescopes, it was found that each of them—the 12-inch refractor, the 2-foot reflector and the 40-inch refractor—was best suited for some particular kind of photographic work.

The big fellow enormously magnified the images and showed details which were not imaginable from pictures made from the smaller instruments. But the big fellow needed so much light to make a picture, with his long focal length, that he would have needed two or three nights, perhaps, to make a photograph which the smallest of the three would have made fairly in six or seven hours.

In fact, it was shown that the great observatory of the future was likely to be not necessarily the possessor of the largest telescope in the world, but the one possessing the largest battery of telescopes, each adapted to some particular work.

There was another field of development going on in astronomy along with stellar photography, and that was the bringing of the methods of the physical laboratory into play more and more.

For centuries astronomers had gazed at stars, measured and observed and studied them with the eye. They had come to apply analytical apparatus to the end of the telescope and record therewith facts about the stars that could not be perceived with the eye. And they had come to a point beyond which they could not utilize this apparatus with the revolving telescope.

Every pound of weight added to the chance of deranging the telescope, and, besides, there was no room to attach the big spectroscopes, twenty-five feet or more in length, to the end of the tube. And the possibilities of the use of this apparatus were as alluring as were those of photography.

Away out there millions of miles distant is a star. To the eye it remains year in, year out, a fixed point of light. Even through the telescope it does not appear to move, so slight is its orbit compared with the enormous distance that separates it from us.

Yet it is whirling through space as we are, about some sun which it obeys, as we do ours. How do the astronomers learn this? Through the spectroscope.

Every one is familiar with the fact that when a whistling locomotive is approaching the pitch of the whistle rises, and as the engine recedes it falls. This is because the sound waves are crowded together by the onrushing engine, and shortened as it approaches, and are drawn out longer as it goes the other way.

The same thing happens to the light of an onrushing star. The eye cannot detect it, but the spectroscope does.

The astronomer allows the light of the star to come through a slit and be broken up by the instrument. He selects a single line of the spectrum of the star, chooses a guide line beside it and watches it.

If the star is approaching, the light waves will be shortened, and the light will become slightly nearer the violet. If it is receding the waves will be longer and the light will approach the red.

Red is low pitch in light, and blue is high pitch. As the star swings about the curve at this end of its orbit the light gradually returns to normal, because the star, while moving just as fast, is not approaching us as much. As the star turns back the line goes the other side the normal.

By continued observation the astronomer finds how fast and how far the star goes each way and how often it does so. In the case of some stars he discovers that what appears to be one is really two, which is shown by the fact that a line will divide into two and one part move up and down the spectrum at the same time. Such stars are known as spectroscopic doubles.

With another bit of apparatus the astronomer measures the heat the stars send us. Some night in winter when you are out of doors hold your hands up and let Arcturus warm them.

You may not feel the heat, yet Arcturus sends us most heat of all the stars. Astronomers say it is the hottest. It gives us as much heat as a tallow dip, six miles away, would do.

You cannot feel that, with your thick skin, but the radiometer detects it and even less with ease. For instance, this instrument has been known to detect and measure the heat emanating from a man's face 2,000 feet away. And the man was an Oberlin professor in an ordinary state of placidity.

With such instruments as that to use the astronomer does not want to be kept down longer to watching the stars through a revolving telescope. He wants to be able to mount his apparatus on brick or stone piers solidly and to have the best and biggest apparatus he can get so he can make his measurements with the greatest accuracy.

He doesn't want this apparatus to be moved and swung at the end of a six-ton tube mounted on a pivot. He wants it where he can encase it and keep it at even temperature, as he can not do in the old way. And he wants to be able to switch the star image from one instrument to another.

So he has come to the horizontal fixed telescope. There have been many small, experimental telescopes of this character built. There was a large one at the Paris Exposition of 1900, but it was probably never finished, for no astronomer got the benefit of it.

In that same year the University of Chicago astronomers, having occasion to observe an eclipse of the sun in North Carolina, built one. The eclipse was to be total. The astronomers wanted photographs made with long focus and showing details.

It would have been manifestly too expensive for consideration to build massive foundations and erect an enormous telescope and dome down there for that occasion. The eclipse would not be total at Lake Geneva, Wis., so they built in North Carolina a long wooden shed, light tight, horizontal, with a dark room at right angles at one end of it.

The shed was 61½ feet long—the exact focal length of the 6-inch lens they proposed to use. A cœlostat, or clock motor, carrying a plane mirror was set up in front of the shed, and reflected the image of the eclipsed sun through the lens down the shed to the plate.

It was necessary, or desirable, to make several exposures. The total phase lasted eighty-seven seconds. So a track was built in the focal plane, and a ball-bearing carriage set on it, and on this seven plates were put.

Then the workers, who stood in the dark room behind this line of plates, had but to move them along one at a time, with the greatest possible speed, exposing one a quarter of a second, the next a half, the next two seconds, the next four, the next eight, and one fourteen and another thirty seconds.

When they were developed each was found to contain a fine picture of the eclipse—each good for some especial feature, the shorter exposures for the brightest parts of the corona and the prominences or bursts of flame, the larger exposures for the margins and duller portions of the corona. They were the sharpest in detail and the best pictures of such an object ever taken, and when enlarged many times and thrown upon a screen by a magic lantern gave thousands of persons, thousands of miles from the scene, views of the eclipse better than they could have obtained had they been there to see it.

This long, horizontal telescope was a perfect success. When that was demonstrated the astronomers set to work to build a larger one, which should be permanent, and should combine with this photographic feature the use of the larger apparatus in permanent mounts.

The result now stands on the observatory grounds, ready for the cœlostat and the laboratories. It is a wooden shed, like its predecessor, and this one is 165 feet long, about 8 feet wide and 5 or 6 feet high, with a gable roof.

It resembles nothing so much as a long and well-built chicken house without doors and windows. It is open at one end. To the lay observer there is nothing astronomical about it.

In the workshop of the observatory a thirty-inch reflector is ready for its mount. There will be no lens in this telescope, for lenses, being of glass, absorb heat and affect the light. It is desired to have the star rays enter the apparatus without change as they reach the earth.

Down at the other end of the tube will be the concave mirror which will focus the rays, and this will be mounted on a track, so that it can be advanced or drawn back, to focus the image on the photographic plate on a mount inside the tunnel, or to throw it into the slit of a spectroscope farther back in the laboratory.

With this instrument so near completion the enthusiasm of the astronomer has increased. He does not expect to take pictures of the faint stars with this. He expects to devote its photographic attachment to the brightest stars and nebulæ and to the sun and moon. But for this work he is already eager for larger machinery.

"The thousand-foot telescope must come," declared one of the astronomers the other day as he threw a photograph of the big tunnel on a screen in Fullerton Hall, Chicago. "I will not be surprised if before many years we see it realized—a thousand-foot telescope, with a ten-foot reflector, mounted on a high tableland, and unfolding wonderful things to us."

The possibilities of such an instrument can best be conceived when we consider that through the 40-inch reflector a photographic image of the moon seven inches across is obtained. In the 165-foot telescope the moon will appear more than 19 inches across. Through the 1,000-foot telescope the observer will behold a moon 100 inches in diameter.

Every little detail will be enlarged more than fifteen times, and the 8x10-inch plates now used to cover the whole image will then be used to obtain a picture of some single crater or some dark valley of the moon.

The development of this astronomical apparatus and of the science has been rapid and wonderful, but it has been marked by no more noteworthy phenomenon than the emancipation of the astronomer.

How do you thing of him in your inmost mind? Is it not as a snuffy old man, bent and slow, the abject slave of the big clock-moved tube? Do you not think of him as shaping all his life as the tube directs, following it as if in chains across the observing floor, recording what it is pleased to tell him, begging it in vain to yield greater secrets? Do you not?

Well, that is the old astonomer, the slave. But the emancipation proclamation has been written for him. He has learned to read and has read it. The messages the stars have been sending for ages, and which the telescope refused to translate, the new apparatus has made clear to him.

And with the knowledge thus gained, he has arisen, thrown down his former master, and now chained him to the ground and compelled him to direct the messages wherever the astronomer will have them, into that apparatus which will best translate them into the language of the senses.

JAPANESE ACCUSE FRENCH.

Say Latter Are Fomenting the Rebellion in Southern China.

VICTORIA, B. C., April 15.—The press of the Orient seems to regard the situation in South China, where the rebellion is assuming large proportions, as very serious.

The Japan *Times*, which among other papers was received by the steamer Rio Jun Maru from Yokohama, says under the caption of "Serious Outlook in China," that the telegrams from Kwangsi show that a disturbance resulting from the Boxer outbreak of two years ago is now going on there, that the trouble is being fomented by the French that it may give Russia and that country the pretext for interference, and that serious complications may be looked for in consequence.

There was a sanguinary battle between the rebels and the Government forces under Gen. Mayup Kwan on March 18, and although the imperial officer reports that his force killed about 1,000 of the rebels with the loss of 80 of his own men, the rebels continue to advance.

The battle took place in a valley. The imperial troops surprised the rebels, who advanced right up to the masked batteries. The Government forces opened fire on them at close range, as they were marching in solid formation and carrying their banners, the majority of which bore mottoes saying "Rob the rich—succor the poor."

The first discharge resulted in heavy loss of life, but the rebels were not disheartened. They charged the batteries and captured and destroyed the field guns of the Government forces. The Imperial troops fled after five hours of hard fighting at close range.

The rebels have robbed in a wholesale manner along their line of march, despoiling the people of money, grain, cattle and everything that could be carried away. They have killed a number of villagers, old and young, and also the Mandarins in the towns which endeavored to resist them.

According to well-informed advices the rebel forces now number over 60,000 and most of them are carrying modern weapons.

The commander of the French eastern squadron offered to despatch 500 bluejackets to the assistance of the Chinese Government troops, but the Viceroy of Kwangsi declined any assistance. He did so, it is understood, on orders from Pekin, on it being learned there that the French were alleged to have had something to do with the start of rebellion.

Kwangsi, although the scene of the most serious trouble, is not the only scene of rebellion in China. In Honan there are tax riots, the great trouble being in the districts of Nangyang and Tung Po. After a short siege the church of Pi Tang was captured and burned, fifteen converts being thrown into the flames and burned to death, while five others were murdered. An Italian priest was put to death, but two others escaped. The insurrection in Honan is due to the disaffection arising from the burden of the indemnity in consequence of the late Boxer outbreak.

At Tahing-fu, in Chili, while the officials who were escorted by a force of Government troops were endeavoring to collect a tax imposed to pay an indemnity to the local Catholic missions, the United Villagers' Society, which was affiliated with the Boxers in their rising, rose in revolt. The rebels were armed with spears and swords, and, believing themselves safe from danger by reason of a charm worn by their leader, they attacked the Government troops, who were armed with modern rifles. The loss of the rebels exceeded 700, while few of the Government forces were killed.

According to the Pekin correspondent of the Tokio *Arahi*, the native Christians are bringing trouble on themselves by reason of their arrogant bearing since the imperial edicts urging the protection of the Christians from harsh treatment were issued. These edicts have encouraged the converts to show disobedience to the Provincial authorities and ill feeling between Christians and officials in several Provinces is steadily growing.

MENDING SLEET-STRUCK TREES

Expert Ought to Do It, But If One Isn't at Hand Here Is Some Advice.

"One of the lessons taught to arboriculturists by the disastrous sleet storm of last February," a landscape architect told a SUN reporter, "is that a better class of trees than soft maples and poplars should be planted in this part of the country if they are to last. The maple invariably breaks in a severe wind. Now, oaks, for instance, bear the storms of countless ages and represent a strength and lasting quality which should be representative of all tree planting intended to be permanent.

"The damage wrought by that storm cannot be estimated till the time comes when the trees break into full foliage. But greater damage than by the storm itself is resulting in many cases from lack of care of the afflicted trees or of improper treatment of them.

"Sensible tree lovers who have any damage to repair will see first of all that the man who sets about pruning the disabled tree knows something about trees. The trouble is that frequently any jobbing carpenter is called in to do this pruning, because the owner is afraid that the trees will bleed to death and therefore won't wait for a real arboriculturist to tackle the damage.

"The consequences are usually bad for the trees, whereas the bleeding was probably nothing more than the getting rid of excess sap, which would have gone to support the parts broken or cut off, and would have done no harm to any well-established tree.

"If you can, employ a tree expert to prune your trees. If you cannot, here is a little general advice which may benefit you in doing it yourself.

"First of all, see that the branches are cut off smoothly and a complete covering of bark around them. In very many cases the broken branches have fallen and stripped the bark from the remaining portion. If these stripped surfaces are extensive, they will rarely heal over satisfactorily, and the branches should be cut below them.

"Where any cuts are made, paint the surface thickly with any ordinary paint. Shellac is unusually good. If these surfaces bleed or if the weather be rainy, the painting may have to be delayed until the wood is dry. In all cases this paint must be renewed during the year and the year following.

"Do not allow branches to be cut away so as to leave short stumps. In nine cases out of ten such stumps decay.

"Finally, remember that where a great quantity of shoots spring from the pruned branches, they should be thinned out before they are more than six or eight inches long. And the best way to remove them is to pull them out from the tree, because if they are cut off more shoots will probably follow."

MODERN ARTIFICIAL TEETH.

SCIENCE, SKILL AND ART IN THEIR PRODUCTION.

Even Temperament Matched in Teeth—Progress in Other Dental Appliances Shown by Thousands of Patents—Lead of the United States in Dentistry.

"Away back, a hundred years and more ago," said a man acquainted with the subject of dentistry, "artificial teeth were made chiefly of bone and ivory, and were carved out by the dentist himself. Now the artificial teeth used throughout the world are made of porcelain, and almost without exception they are factory made. And there are more artificial teeth made in the United States than in any other country.

"In old times, with the earliest use of porcelain for this purpose they made teeth of one type and in about three color shades. Porcelain teeth are now made in a great number of shades, so that any natural tooth may be perfectly matched. They are made also in special shades called for in one country or another, and even black teeth are made for use in lands where the custom of staining the teeth with betel prevails.

"Artificial teeth are made with coloring in imitation of smokers' teeth, and so on. In fact, there is scarcely any shade or shading of human teeth that could not be matched in artificial teeth found in stock. There is none to which there would not be found a close approximation.

"And as to shape, artificial teeth nowadays are made not upon a single type, but in all human types. It is a familiar fact that people of different temperaments have teeth of different types. The person of nervous temperament, for example, has teeth that in shape, size, color and other characteristics are peculiar to him. The person of bilious temperament has teeth quite different in character; and so on. Artificial teeth are made nowadays in all these temperament types.

"Counting the various kinds, as to their place in the jaws, and the styles, shadings, and other variations in which they are produced, you would find artificial teeth made nowadays in thousands of varieties, to fill every known requirement; and if something still different should be required it would be made to order.

"As everybody knows artificial teeth are now made to look more like the natural teeth than ever before. There are made nowadays many sets of artificial teeth that would never be taken for other than those that had been provided for the wearer by nature. But of course, not all artificial teeth, even now, are so nearly perfect as that.

"It is an interesting fact that there are persons who, when the need of artificial teeth is forced upon them, insist upon having pretty teeth, with which request the dentist is compelled to comply. And then there are, of course, dentists who themselves in supplying a set of teeth would give more attention to adapting them perfectly to their main purposes than they would to their perfect appropriateness, besides, in the head of their wearer. Even in these days we might meet persons wearing artificial teeth not suited to their own temperament type; a nervous person with bilious type teeth, and so on.

"And again in the profession of dentistry, as in every other, some men are of greater learning, higher skill, and truer art than others. And such, as naturally commanding higher prices for their work, may make the perfect teeth more or less a question of money. But still the fact remains that artificial teeth in general are made far more natural in appearance now than they ever were before.

"Plates for artificial teeth were made formerly of gold and of platinum, to which have now been added vulcanite, or hard rubber, and celluloid. By far the greatest number of all the plates now used are made of rubber. Of these modern materials plates are made far cheaper than was ever possible before.

"As a result, artificial teeth all around the world, wherever used, are now far more extensively used than ever before; though in proportion to the need for them they are, perhaps, more commonly used in the United States than in any other country. This is due, for one thing, to the fact that dentistry has made greater advances here, and for another, to the fact that the people here have more money.

"Thus far we have taken into account only teeth on plates, the form in which artificial teeth are most commonly worn; but there are also to be considered crowns and bridge work, in which forms of artificial teeth have great advances likewise been made. Both these methods require more science on the part of the operator and a greater skill than would be required in the more familiar forms of dentistry, and both are more costly, though the cost of crowns has already been materially reduced.

"A crown is a tooth body, in whole or in part, replacing the original and permanently attached to the original root by means of a mechanical device within it. Crowns are made in some cases of gold, in some cases of porcelain.

"Bridge work consists in the permanent installation, in place of the missing natural teeth, of artificial teeth, one or more in number, which, on a suitable mounting, are anchored to natural teeth remaining, or, it may be, to crowns. Bridge work calls for the exercise of the highest skill and art employed in dentistry, and it is also the most costly.

"Formerly the same dentist did every part of the dental work that the patient might require: from taking out his old teeth to supplying him with new. There are, of course, such dentists now: but there are also many specialists who confine themselves to the practice of special branches.

"Within comparatively recent years there have been introduced many improvements on the practical side of dentistry. Of course, while many a tooth has been drilled by hand, for filling, foot power and hand power machines for such purposes have for many years been employed; but now we have electricity, electric lights to illuminate the interior of the mouth, and electrically operated drills and hammers, delicate power tools of beautiful certainty and precision of operation, with which the work can be done not only better but in far less time than formerly.

"But if you were to attempt simply to enumerate the instruments, tools and appliances used in modern dentistry you would have to write a book to hold the list. There have been issued more patents for dental than for electrical appliances; they number thousands. New things or improvements are constantly being added.

"Take for example forceps. Of dental forceps there are now made about two hundred varieties, adapted not only to every known use, but to every sort of personal requirement of the dentist using them. Thus there are forceps with handles fashioned to suit any sort of hand or grip; and as to the beaks of these various forceps they are made in greater variety than the beaks of birds.

"American artificial teeth are exported literally to all parts of the world. There are some big establishments producing artificial teeth in Europe, and they are of course not idle in competing for the world's trade. But the exports of American porcelain teeth are greater than are the exports of any other tooth manufacturing country; and actually and proportionately our exports are all the time increasing. American teeth are sold in Iceland and in Africa, in Australia and in India, in France and Russia, in North and South America, and, comprehensively, in Europe, Asia and Africa.

"And we sell them also other dental supplies, and tools, appliances and equipment. As for example, dentists' chairs that can be put into a small compass for transportation. These chairs, when knocked down for shipment can be packed in a box not very much bigger than the box required for the packing of a croquet set. American portable dental chairs of this description are sold in lands and in localities not reached by railroads or, it might be, by any sort of roads, but approachable only by trails. Such chairs are, for instance, packed on the back of mules over the Andes to interior points in South America.

"In this country, indeed, the manufacture and supply of artificial teeth, and of the manifold requisites of modern dentistry, has long since grown into a great business; and it would not be flapping the eagle's wings unduly to say that in all these things, as well as in the practice of dentistry, the United States leads the world."

GREATEST OIL SPOUTER.

It Pours Out 2,000,000 Gallons of Petroleum Before It Quiets Down.

The Russians assert that they struck the biggest oil spouter in the Baku petroleum fields last fall that was ever tapped. They sank a new well in the Bibi-Eibat district about three miles southwest of Baku and reached a depth of 1,800 feet before they struck oil. Then it went to spouting and is said to have been the largest producer for the first two or three days that was ever struck. It is accredited with 180,000 barrels a day for nearly three days and then the flow diminished a little; but it continued flowing until it had produced over 2,000,000 barrels. This happened in November last.

Before the well stopped flowing another big one was struck in the Romani district about ten miles northeast of Baku. This spouter produced nearly 1,000,000 barrels and was still flowing at the rate of about 25,000 barrels a day on Jan. 31 last. These were the two great spouters of the Russian oil fields last year.

Remarkable as it may appear, it is said that the owners of the big well which produced more than 2,000,000 barrels in a little over thirty days lost money by this extraordinary outpouring. This would seem impossible without explanation, but the sad reason for it is clearly set forth in Consul Chambers's report that has just been published in Washington.

In the first place the well could not be controlled. High winds were blowing nearly all the time and every house near the well as well as all the buildings in the village, more than a mile a way, was deluged. It is said that the owners of the well must pay for repainting all the houses in the village. The owners had to pay the Government a royalty of two and a half cents for every five gallons of oil, and they could not sell the oil they saved at a profit of more than about a quarter of a cent per five gallons above the royalty and their expenses. It is said that this meagre profit did not even pay the heavy damages that had to be disbursed to the aggrieved property owners.

This is not the first time that the village mentioned has been damaged by a flowing well. Some years ago a well in the same district sent a spray of oil to this village and the owner of the well had to pay damages amounting to $50,000, as he was compelled to repaint the entire village, including a fine Russian Church.

BUDS IN SPRINGTIME.

An Interesting Study in Miniature of the Foliage That Is to Be.

"Now is the time for one of the most fascinating studies in nature," said a gardener, the other day. "It is interesting both to those who know only a little botany and those who know much. The study, I mean, is that of the buds of the trees as they prepare to unfold in the spring.

"Take your buds under observation just before they actually open, when they are being excited by the warmth of the season. Most large scaly buds will reveal their complete history for the season in advance. You will find in them, in miniature, leaves and stems and in some cases flowers also.

"Then the leaf coverings are interesting in themselves—different fashions in tree dress. The horse chestnut has a coating of sticky glue, which, like grease on shoe leather, keeps out the elements. Other buds have velvety coverings like cloaks to keep them warm and dry.

"Some buds will cover flowers only. You may introduce spring into your house ahead of time by cutting off branches of these trees and putting them in water in a warm sunny window. The Cornelian or double cherry and the yellow Forsythia are willing subjects for this.

"Then there are the fuzzy tassels of the elm and the larch which again are different from all the others and even more interesting. You must catch them in time though, or on the morning on which you go for them you will find the tree already in leaf and the ground beneath it covered with a thick carpet of the graceful pendants which lately adorned the tree.

"But there are scores of trees and something interesting about all of them in the budding stage."

LOBSTER PIRATE IN MAINE.

One Man Who Discovered a Way to Break the Law With Impunity.

PORTLAND, Me., April 19.—The growing scarcity of lobsters and the great demand from New York and the Western States have driven the lobster fishermen of Maine to all kinds of schemes for evading the law against selling short lobsters. The game wardens have discovered that one man has found a way to violate this law with impunity.

He has fitted out a steam launch with kettles and other facilities for boiling lobsters, and in it has cruised along the coast buying the short lobsters at two cents apiece from the fishermen as they haul their traps. He at once breaks the claws and tails from the lobsters and boils them in his kettles aboard the launch. If the wardens come upon him there is nothing in his possession which proves that he has broken the law.

The meat is picked from the tails and claws, packed in ice and sent to Boston, principally for the hotel and restaurant market. He can handle 850 pounds of lobster meat a day in his launch and is doing a land office business at a large profit. He has already given an order for four more launches similarly fitted and others are planning to go into the business.

The State lobster wardens view with alarm the growing business of this lobster pirate. There is no way that they can convict him under the present law. In order to suppress this new scheme it will be necessary to supply the wardens with fast steam launches to follow the pirates along the coast and catch them in the act of buying the short lobsters.

RECLAIMING SWAMPS.

Marshes in Northern Minnesota to Be Turned Into Fine Farming Land.

A great deal of northern Minnesota is about as flat as a floor. Over a wide area east of the Red River Valley the water partings between the streams are scarcely perceptible. Many of the streams meander in tortuous courses sluggishly over the prairie and lose themselves finally in big marshes. Some of the rivers, as shown on the maps, appear suddenly to terminate just as rivers are marked on maps of deserts where the streams are lost in the sands.

A number of these large marshes are not far from the Red River Valley. It is proposed to dig some long ditches to lead the waters of these now sodden and worthless lands into the valley. The Lost River ditch will be four miles long, and will drain 22,000 acres of swamps; the Badger ditch will be eight and a half miles long, draining 5,000 acres; the New Solum ditch will be four miles long, draining 1,000 acres; the Goodhope ditch, five miles in length, will also drain an important area.

The total cost of these four ditches is estimated at $26,500, and they will turn 30,000 acres of swamp lands into the richest of fields and meadows, adding most appreciably to the productive area of the State and improving the health conditions in that part of the country. The contractors have already begun the work on these important improvements.

A GRIDDLE-CAKE TANTALUS.

Angelina's Culinary Triumph Too Late for Her Husband to Enjoy It.

"Experience is a wonderful thing," said the young married man. "For instance: Don't have griddle cakes for breakfast when your wife's without a cook.

"Angelina offered to make some the other morning the day after Katie the chef had demanded her passports. Angelina said she had made them before and besides she had the recipe in her cook book.

"I'm fond of griddle cakes and fonder of Angelina. The combination appealed to me.

"'That's a glorious idea,' I said.

"Angelina rolled up her sleeves a little way and put on an apron that had an enormous bow behind when she had tied it. Then she consulted her cook book for a long time, frowning tragically, and finally proceeded to mix things with an air of resolution. Meanwhile the soap stone griddle was getting hot.

"'Now you sit down at the table and be all ready,' said Angelina, pouring two little puddles of batter on the griddle.

"Another minute and Angelina slid the first products of her art into my plate and passed me the butter and maple syrup. Then she waited severely.

"'How do you like them?' demanded Angelina.

"They were prepossessing, fat, little griddle cakes, though a trifle pale.

"'They are all right,' I said, heartily, eating rapidly to prove my sincerity. 'Perhaps they might be a trifle better done. The insides seem a little bit pasty, but very delicious.'

"'Oh, I'll fix that this time,' said Angelina, hastening into the kitchen.

"The next two showed a beautiful brown, but strangely enough, they had a decidedly charred taste.

"'I don't understand it,' declared Angelina when she had forced the confession from me. 'You can see for yourself that they're not burned. Perhaps the gas flame has something to do with it—'

"Just then I turned what was left of the cakes over. They had a thick black crust on the under side.

"'I see the trouble,' said Angelina. 'You know after you put them on the griddle you turn them when they begin to bubble. But after you've turned them once there's no way of telling when the other side is done. You have to guess at it, and I've let these burn.'

"Angelina looked so distressed that I finished the cakes, char and all, in three mouthfuls.

"'Now try those,' said Angelina, bringing in two more. They were a dark russet all over without a sign of burn.

"'These,' I said, sampling them, 'are great.'

"'Now, I want you to tell me the truth,' demanded Angelina, 'or how can I ever get them exactly right?'

"I waited until I had consumed 270 degrees of both cakes. Then I said:

"'Well, the flavor is delicious, but they are just a little bit—er, leathery.'

"'I was afraid they might be,' said Angelina. 'I left them on just a moment too long. You wait a moment.'

"She returned with two golden ones.

"'Try those,' she said triumphantly.

"I tried them. The mouthful melted in the mouth. They were light and hot and crisp. They were the poetry of griddle cakes. But—that first mouthful was my last.

"I had eaten six of various degrees of heaviness and impenetrability and consistency. There were no further griddle-cake possibilities within me. I explained the situation to Angelina delicately.

"She ate seven. She said she had got them just right at last, and she had. But the next time Angelina suggests griddle cakes when we are without a cook I shall not encourage it."

FEW ARTISTS IN BEARDS.

A Delusive Sign Often Seen in Barber Shops in This City.

"Such signs as 'Artistic Hair Cutting and Beard Trimming' are not infrequently seen," said Mr. Glimmerton, "but the number of artistic hair cutters and beard trimmers actually to be found is small. This is especially true as to beard trimmers, for a much higher art is required in beard trimming than in hair cutting, the reason being simple.

"The contour of the cranial part of the head remains practically the same through life; and while there is, to be sure, room there for the exercise of art as well as skill on the part of the barber, yet hair cutting might be described as an exact art, attainable in fair degree, at least, by almost any barber skilled in the use of the tools of his trade, for in it he has fixed lines to work upon.

"But the contour of the face and neck and chin is changing all the time; and to trim a beard into such proportions that it shall be in harmony with the rest of the head while at the same time it shall hide the defects of the wearer calls for the exercise of an art that few possess.

"There are plenty of barbers, excellent workmen, who can trim beards with absolute precision, making a job mechanically perfect. But how many are there that can carve out of any given beard the happiest attainable result?

"How many barbers are there, indeed, who even though taking due note of the creases, corrugations and general bumpiness of increasing age can so trim the beard as not only to conceal these departures from the smooth lines of younger years, but at the same time, to give to it a graceful touch and finish? Not a very large number, surely.

"And how many beard trimmers are there who, rising higher still, can hide such art under such naturalness of effect that, with his beard most appropriately, advantageously and artistically trimmed, the subject of it does not look as if he had just come from the hands of the barber?

"Truly the number of great barbers is small. But then what proportion of men truly great do we find in any calling or profession?"

FROG FARMING IN CANADA.

The Industry Officially Reported to Be Profitable and Growing.

QUEBEC, April 19.—Frog farming as an industry is assuming large proportions in many parts of Canada. Not only are large shipments of frogs' legs made from this country to the United States, but there is a growing demand for the luxury in many of the large centres of the Dominion.

One of the most successful frog farms is in Ontario. Last year it produced 5,000 pounds of dressed frogs' legs and 7,000 living frogs for scientific purposes and for stocking other waters.

The Deputy Commissioner of Fisheries for Ontario reports that in the past year a number of applications were made to the Government for leases of lands suitable for this industry. No licenses were, however, granted, as it was found that the territory concerned was already being farmed by a number of people.

It is safe to assume that in the very near future much land now idle will be stocked with frogs. All that is necessary for this purpose is to place a few paired breeders in the water. Natural food is almost always present in sufficient amount for successful growth.

The species considered here to be most profitable, on account of its size, is the Eastern bullfrog, *Rana catesbiana*, which reaches a length of more than eight inches. It begins to breed at the end of three years, is very productive and reaches a marketable size in four or five years.

Only the hind legs are marketed, and they average half a pound a pair in weight. They are worth 50 cents a pound, at times, to the producer, and American dealers take as many as Canada can supply.

THE RUSSIAN HEBREW MAIL.

A SATURDAY NIGHT SCENE ON THE EAST SIDE.

Newcomers Who Assemble by Hundreds at a Banker's Office to Get Their Letters—Pathetic Incidents of Mail Time—It's a Holiday Gathering Also.

When a Russian Hebrew arrives here he is as a rule poor as a mouse, starved to the danger point and full of longings to see once more the people he has left behind. It may be parents only, but more often it is a wife and children for whose subsequent coming he is to pave the way.

His first task then is to get work; his second to write a long letter home, telling of his successful landing and of some of the wonders of the great country which he has had a chance to observe. After that his life reduces itself to a long, toilsome, heart-crushing wait for the reply from the other side.

But how is that reply to reach him? His place of work and his place of residence are two facts of equal uncertainty. He labors in a sweatshop among a hundred others. He lives together with a dozen others in a small room up under the roof of some tall tenement—a human hive where it is as easy to find a newcomer as it is to pick out a needle from a bale of hay.

Even the men who live in the same room know him only as Jake or Mose or Abe. To-day he is here, to-morrow there and the third day somewhere else. Like a piece of wood in a mill race, he is thrown hither and thither in his efforts to earn the most and spend the least within possibility. How then is Uncle Sam to ferret him out and give him the letter he awaits so anxiously?

The question has been asked with anxiety by generations of Russian Hebrews arriving in this country under similar circumstances and some friend, some chance acquaintance of the same race and faith, has always been on hand to answer:

"Why, just have your letters sent to Max Kobbe, the banker, and then you go there and get them when the mail gets in."

That is the purport of the answer, of course Anglicized and boiled down. When given in its original form it was very long and sounded as if somebody had shaken all the consonants of the alphabet in a hat and then tried to pronounce them in the order they happened to come out, without the aid of any vowels. But it served its purpose just the same.

Every Saturday night at 7 o'clock the mail of the Russian Hebrews of the lower East Side is distributed from the banking office on Canal street, not far from East Broadway. An hour before that time the sidewalk and the street in front of the place are black with people, all looking very much alike.

Their complexions are swarthy, their noses hooked like beaks, their beards long, black and curly, their shoulders round, their backs bent, and every one of them wears a black derby pushed very far back on his head. A reward might be offered for anybody able to discover a genuine, recently-arrived Russian Hebrew wearing any other kind of headgear than a black derby.

And when they speak all at the same time it sounds like the buzzing of a shopful of machinery heard from some distance. Every Russian Hebrew in the neighborhood seems to have come there. Women, though, are but rarely seen.

While the distribution of the mail is the excuse for this gathering the real cause of it is as much the desire to meet friends and countrymen and to have a good long chat. It is their holiday—for they are all orthodox—the only day on which they grant themselves a brief rest, and they have nothing to do but to enjoy themselves. This they do to their heart's content by gossiping while waiting for the mail.

At 7 o'clock sharp the doors of Mr. Kobbe's office are thrown open and the whole crowd tries to get in at the same time. The air is full of hands and ear-grating gutturals and to an outsider it looks as if a fierce fight were going on.

The contest is much friendlier than a freshman rush, however, and no harm is wrought except to a few tempers that are a little too quick. Inside the doors the crush continues.

All but a narrow hallway has been partitioned off. In that partition there are two regular openings, about two feet wide and about four feet from the ground. Through each opening four eager heads are poked at the same time. The heads are silent, strange to say. Only their eyes speak. They are looking wistfully at a smooth-faced businesslike young man behind the partition.

That is the clerk in charge of the mail. Last Saturday, while he was at work, a SUN reporter was perched on a high office chair by his side, watching the distribution of letters and the crowd that came for them. The letters were arranged in alphabetical order in a row of pigeonholes just back of the clerk. There were about 2,000 of them and fully one-fourth of these had arrived in a single mail the day before.

Most of the letters were enclosed in envelopes with the banker's name and the office address printed in large type on the front. These envelopes are given out to the patrons of the place and by them sent to their friends and relatives in Europe to insure the safe arrival of the reply.

The clerk evidently knew every face in the crowd and also who had letters to get and who had not. Pointing a long, bony finger at each expectant face he gave the applicants to understand in monosyllables whether they were doomed to disappointment or not. It sounded something like this:

"Knee-toe, knee-toe, knee-toe, knee-toe, Krsasolsvitch, yah, knee-toe, Mstrchvitch, yah, knee-toe, knee-toe, Guorgischvitch, one cent, knee-toe, knee-toe, &c.

Each time he uttered a name he turned quickly to the pigeonholes, fished out a bunch of letters, extracted the proper one and handed it to the smiling owner. When he accompanied the name by the words "one cent" a long pause always followed. It meant that the letter was insufficiently stamped and that the recipient had to pay up to get it. The process was heartbreaking, but it always ended with the production of the demanded coin.

"But what in the world does 'knee-toe' mean?" asked THE SUN man, finally.

"Knee-toe?" repeated the clerk. "Ah, you mean 'nito'"—he then pronounced the word scientifically, with sharp stress on the second syllable and a long string of guttural fancy sounds trailing after the final "o." "That's Yiddish for nothing," he exclaimed. "No mail, it means; nothing come, nothing to get; see?"

Some of those who received that answer clung to the opening in spite of all pushings from behind by others eager to get their places. Without saying a word they stood there with craned necks and eyes gazing at the man behind the partition as if it were impossible for them to believe that the letter they wanted had not come yet.

At last, when the word had been hissed right into their faces a dozen times, they drew back unwillingly, sighing, perhaps, as they went. After an incident of that kind the clerk turned around to the visitor by his side.

"That man has been coming here for a year now," he said. "Up to that time he used to get letters regularly. Then they ceased at once and none has come in the last year.

"Each Saturday he is looking more pale and unhappy, but still he keeps on coming here. Sometimes he even drops in during the middle of the week to ask for the letter that never will come."

There's a Tobacco Chewing Dog in Jersey.

Out in Bayonne, N. J., there is a dog that prefers chewing tobacco to bones. He learned the bad habit from his master, but he must have had an inherent liking for the weed, for he took to it at the first attempt. Now he recognizes his owner's tobacco pouch whenever it appears from the latter's pocket, and barks and dances until he receives his share of the contents. Then, contented and happy, he stretches himself out in the sunlight, and like a gum-chewing school girl his jaws work even in his sleep.